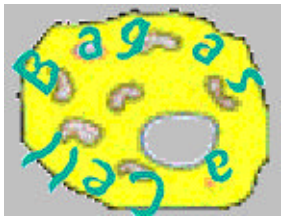


STANDARD 3200-03 Students will understand structure and function of cells and organisms.

OBJECTIVE 3200-0302 Investigate cellular structures and functions.

Intended Learning Outcomes:

- 1a, d. Make observations, measurements, estimations and predictions based on current knowledge.
- 2a. Identify variables and describe relationships between them.
- 5a. Know science terminology appropriate to grade level.
- 6d. Construct tables, graphs, charts, diagrams, and models to describe and summarize data.
- 7c. Understand that all science is based on observation of natural phenomena, but that all observations are influenced by the observer's prior knowledge, experience, and theoretical perspective.

Background:

- Learner should know the main parts of a cell.
- Learner should understand particle movement.

Summary:

Students will use bags as cell models and demonstrate diffusion.

Observations:

Have students observe the properties of iodine solution. (liquid, tan colored) Have students observe what happens to the color of iodine as it comes in contact with starch in the form of bread. (The iodine turns black in the presence of starch it is an indicator of starch.

How might a bag be like a cell? (It can hold things like a cell. The bag would be the cell membrane.)

Materials:

For use by the class: Box of cornstarch and iodine solution

For each group of students: small plastic bags, small rubber, bands, 1 - cup measuring cup, scissors, 600 mL beaker, access to warm and lukewarm water

Safety concerns:


Teachers and students, be sure to keep all Glass, Chemical, and Sharp instrument Safety Rules that are specified by the teacher and in all general laboratory experiences.

Student Procedures:

1. Add one teaspoon of cornstarch to 1 cup of water. Stir until the cornstarch is dissolved.
2. Pour the mixture into a small plastic bag. Wrap a rubber band around the top of the bag to seal the bag.
3. Pour 100 mL of warm water into a 600 mL beaker.
4. Carefully place the bag with the cornstarch water into the 600 mL beaker.
5. Let it set for a few minutes and observe what happens.
6. Answer the following questions:

    Why did the water inside the bag turn black?

    What part of the cell is the bag like?

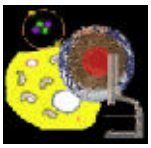
    Which process occurred, diffusion or osmosis?

    Did the starch move out of the bag? How do you know?

Extension:

Are there any other indicators that could be used to show the diffusion of particles across the bag wall?

Does the temperature of the water affect how long it takes for the iodine to move into the cell?



Print this page in Adobe Acrobat format.